

WHAT IS CLAIMED IS:

1. A non-rotating electrodeless high-intensity discharge lamp system using circularly polarized microwaves, comprising:
 - 5 a first rectangular waveguide to transmit linearly polarized microwaves generated from a microwave source;
 - an input circular waveguide linearly connected to the first rectangular waveguide;
 - 10 a second rectangular waveguide closed at an end thereof, and perpendicularly connected to a circumferential surface of the input circular waveguide;
 - 15 an elliptical waveguide linearly connected to the input circular waveguide such that the major axis of the elliptical waveguide is rotated to a predetermined angle relative to a horizontal surface (or the wider surface) of the input rectangular waveguide;
 - 20 a second circular waveguide linearly connected to the elliptical waveguide with a conductive end plate; and a discharge lamp housed in a mesh cover or perforated or apertured metallic cover, and supported by the second circular waveguide while being held on a reflecting mirror.
- 25 2. The non-rotating electrodeless high-intensity discharge lamp system as set forth in claim 1, further comprising a mode filter provided on an interface between the input circular

waveguide and each of the first and second rectangular waveguides.

3. The non-rotating electrodeless high-intensity discharge
5 lamp system as set forth in claim 1, wherein the predetermined
angle at which the major axis of the elliptical waveguide is
rotated relative to the horizontal surface (or the wider
surface) of the input rectangular waveguide, is set to 40~50°
when the elliptical waveguide has a minor-axis diameter of 80
10 mm and a major-axis diameter of 108 mm in the case of the
frequency of 2.45 GHz.

4. A non-rotating electrodeless high-intensity discharge
lamp system using circularly polarized microwaves, comprising:

15 a rectangular waveguide to propagate linearly polarized
microwaves generated from a microwave source;

an elliptical waveguide linearly connected to the
rectangular waveguide such that the major axis of the
elliptical waveguide is rotated to a predetermined angle
20 relative to a horizontal surface of the rectangular waveguide,
with one or more stubs inserted in the elliptical waveguide;

a circular waveguide linearly connected to the elliptical
waveguide; and

25 a discharge lamp housed in a mesh or perforated or
pertured cover, and supported by the circular waveguide while

being held on a reflecting mirror.

5. The non-rotating electrodeless high-intensity discharge
lamp system as set forth in claim 4, wherein four stubs are
5 inserted in the elliptical waveguide.